ABSTRACT OF THE DISCLOSURE

An optical sensor formed from an optical waveguide having at least one core surrounded by a cladding and a large diameter generally D-shaped portion is disclosed. Axial or compressive strain across the D-shaped cross section may be determined by measuring the change in polarization or birefringence of the light output from the sensor. A layer responsive to a parameter may be disposed on a flat portion of the D-shaped portion of the sensor. The refractive index of the layer changes and/or the layer applies a strain on the sensor in response to the parameter. Changes in the refractive index of the layer alters the light output from the sensor, which is measured over time and correlated to the parameter.